these two species are totally different, which shows, says the author, how inefficient a mode of classing animals is furnished by the appearance of the teeth.

On a New Compound of Chlorine and Carbon. *By* Richard Phillips, *F.R.S.E. F.L.S. M.G.S. &c. and* Michael Faraday, *Chemical Assistant in the Royal Institution. Communicated by Sir* Humphry Davy, *Bart. P.R.S.* Read July 12, 1821. [*Phil. Trans.* 1821, *p.* 392.]

The above substance was discovered by M. Julien, of Abo, in Finland, amongst the products arising out of the distillation of calcined sulphate of iron, with crude nitre in iron retorts. It forms white acicular crystals by sublimation, and when passed through a green glass tube containing red-hot rock crystal, it is decomposed with the deposition of charcoal and evolution of chlorine. It is not altered by repeated sublimations in chlorine. It was analysed by passing its vapour over red-hot oxide of copper, by which chloride of copper and carbonic acid gas were produced: the former was decomposed by nitrate of silver, and the proportion of chlorine estimated by that of chloride of silver formed. From this and other experiments, the authors conclude that this substance consists of one portion of chlorine and two of carbon: they failed in their endeavours to convert it into either of the other chlorides of carbon, to which, in its physical and chemical properties, it bears however a considerable resemblance.

On the Nerves; giving an Account of some Experiments on their Structure and Functions, which lead to a new Arrangement of the System. *By* Charles Bell, *Esq. Communicated by Sir* Humphry Davy, *Bart. P.R.S.* Read July 12, 1821. [*Phil. Trans.* 1821, *p.* 398.]

In this paper the author proposes to limit his inquiry to the nerves of respiration, comprehending under that term all the nerves which serve to combine the muscles employed in the act of breathing and of speaking; and after showing that the simplicity or complexity of the nerves are as the functions or organizations of the parts which they supply, and that, however numerous and complex they appear in some parts of the body, they may nevertheless be divided into two distinct classes, by ascertaining what parts are necessary to life and motion, and what are superadded as requisite to higher and more complex enjoyments and actions; the former class comprehending the nerves of the spine, the suboccipital or tenth, and the trigeminus or fifth; and the latter the eighth pair, the portio dura of the seventh, the spinal accessory, the phrenic, the external respiratory, and the lingual; Mr. Bell proceeds to a detailed account of these nerves, showing, by an examination of the nerves of the face, that the two sets differ in structure and sensibility as

well as in function, and illustrating his positions by a variety of experiments, which, with their results, are given at length in this paper; and after showing the practical applications of which the investigations contained in it are susceptible, he concludes by observing, that a just estimate of their importance can scarcely be formed, till an analogous account of the nerves of the throat, neck, and chest shall be laid before the Society, which will show that in them also there are the same distinctions of structure and functions, and that the nerves of respiration may be distinguished and separated amidst the apparent intricacy of the general system, and that by dividing them, the motions of the several parts, which unite in the act of respiration, may be successively stopped; while their other functions, dependent upon their other nerves, are continued.

By pursuing this investigation, the remaining parts of the nervous system are also much simplified, and the apparent confusion arising out of the crossing and re-union of nerves is thus shown to be for the purpose of associating the muscles into different classes, for combining them in subserviency to different organs, and placing them under the guidance of a sensibility more certain in its operation than the will.

Further Researches on the Magnetic Phenomena produced by Electricity; with some New Experiments on the Properties of Electrified Bodies in their Relations to Conducting Powers and Temperature. *By Sir* Humphry Davy, *Bart. P.R.S.* Read July 5, 1821. [*Phil. Trans.* 1821, *p.* 425.]

In this paper Sir Humphry Davy adds to his former details upon the subject of electro-magnetism, by tracing the general effects of the action of electricity on conductors, in their relation to this new property and to heat.

The magnetic phenomena he found the same, whether the electricity was small in quantity, and passing through good conductors of great magnitude, or whether the conductors were so imperfect as only to convey a small quantity of electricity. That these magnetic powers are not affected by the mobility of the parts of fluids, Sir Humphry proved by the electrization of mercury and fusible metal, in glass tubes, which were thus made to attract iron filings and magnetic needles, while imperfectly conducting fluids did not, under similar circumstances, give any polarity to steel. Electricity passed through air, however, produces this effect; and Sir Humphry has succeeded in affecting the arc of fire by the approximation of a magnet.

In investigating the relative conducting powers of substances for electricity, Sir Humphry found that a wire kept cool is a better conductor than when heated; and the knowledge of this fact led to the explanation of a very singular result, namely, that by applying heat to one part of a wire in the circuit, its other parts become colder, and that by applying cold they become hotter; thus, when one part